REMARKS

In the Office Action, the Examiner noted that Claims 1-20 are pending in the application, and Claims 1-20 have been rejected.

CLAIM REJECTIONS UNDER 35 U.S.C. §102(e)

Claims 1-3 stand rejected under 35 USC §102(e) as being anticipated by the Malmuth et al. ('532). The Applicants respectfully submit the attached Rule 131 affidavit for the purpose of overcoming the filing date of the Malmuth et al. patent with respect to Claims 1-3. Given the Rule 131 affidavit which shows conception and actual reduction to practice prior to the December 20, 2002 filing date of Malmuth et al., the Applicants respectfully request withdrawal of this rejection.

Claim 6 stands rejected under 35 USC §102(e) as being anticipated by the Malmuth et al. ('532). The Applicants respectfully submit that the Examiner has not made a prima facie case of anticipation with respect to Claim 6. With respect to Claim 6, which is dependent on Claim 4, Malmuth does not teach or disclose a closed loop control system which activates at least one flow effector by oscillation. Furthermore, Malmuth does not teach or disclose a closed loop control system which only activates at least one flow effector at angles of attack of the missile or aircraft forebody of between 20 and 60 degrees. Given the reasons set forth in this response, the Applicants respectfully request withdrawal of this rejection.

CLAIM REJECTIONS UNDER 35 U.S.C. §102(b)

Claims 1-8 and 11-14 stand rejected under 35 USC §102(b) as being anticipated by Hakenesch ('407). The Applicants respectfully submit that the Examiner has not made a prima facie case of anticipation with respect to Claim 1-8 and 11-14. With respect to Claim 1, Hakenesch does not teach or disclose a closed loop control system, which is used to activate and deactivate at least one flow effector. The strakes in Hakenesch are always to some degree activated causing increased drag on the air vehicle. Furthermore, Hakenesch does not teach the use of a sensor having a signal and being positioned to detect flow separation or side forces, wherein the signal of the sensor is used in part to activate or deactivate the at least one flow effector. In addition to the

above with respect to Claim 2, Hakenesch does not teach or disclose activating or deactivating at least one flow effector to minimize flow separation or change side forces on a missile or aircraft forebody. In addition to the above with respect to Claim 3, Hakenesch does not teach or disclose a closed loop control system that activates and deactivates the at least one flow effector to create commanded side forces on a missle or aircraft forebody. In addition to the above with respect to Claim 4, Hakenesch does not teach or disclose a closed loop control system that activates the at least one flow effector by oscillation. In addition to the above with respect to Claim 5, Hakenesch does not teach or disclose oscillation. In addition to the above with respect to Claim 6, Hakenesch does not teach or disclose a closed loop control system wherein the flow effector is only activated at angles of attach of the missile or aircraft forebody of between 20 to about 60 degrees. The above comments apply to Claim 7 which claims a slightly different configuration.

With respect to Claim 8, Hakenesch does not teach or disclose a closed loop control system, which is used to activate and deactivate at least one flow effector. The strakes in Hakenesch are always to some degree activated causing increased drag on the air vehicle. Furthermore, Hakenesch does not teach the use of a sensor having a signal and being positioned to detect flow separation or side forces, or an inertial measurement unit having an output wherein the signal of the sensor and output of the inertial measurement unit are used in part to activate or deactivate the at least one flow effector. In addition to the comments about Claim 8, with respect to Claims 11 and 12 Hakenesch further does not teach or disclose a flow effector capable of being activated and deactivated at frequencies of at least 1 or 20 Hz. In addition to the comments about Claim 8, with respect to Claim 13 Hakenesch further does not teach or disclose closed loop control system which activates and deactivates the at least one flow effector to create commanded side forces on the missile or aircraft forebody. In addition to the comments about Claims 8 and 12, with respect to Claim 14 Hakenesch further does not teach or disclose a closed loop control system which activates and deactivates the at least one flow effector to create additional side forces on the missile or aircraft forebody. Given the reasons set forth in this response, the Applicants respectfully request withdrawal of this rejection.

Claims 1-8, 11-16 and 18-20 stand rejected under 35 USC §102(b) as being anticipated by Stoy ('243). The Applicants respectfully submit that the Examiner has not made a prima facie case of anticipation with respect to Claim 1-8, 11-16, and 18-20. With respect to Claim 1, Stoy does not teach or disclose a closed loop control system, which is used to activate and deactivate at least one flow effector. The "control fins or canards" in Stoy are always activated – they can not be deactivated, which causes increased drag on the air vehicle. Furthermore, Stoy does not teach the use of a sensor having a signal and being positioned to detect flow separation or side forces, wherein the signal of the sensor is used in part to activate or deactivate the at least one flow effector. In addition to the above comments on Claim 1, with respect to Claim 2 Stoy does not teach or disclose activating or deactivating at least one flow effector to minimize flow separation or change side forces on a missile or aircraft forebody. In addition to the above comments on Claim 1, with respect to Claim 3 Stoy does not teach or disclose a closed loop control system that activates and deactivates the at least one flow effector to create commanded side forces on a missle or aircraft forebody. In addition to the above comments on Claims 1 and 2, with respect to Claim 4 Stoy does not teach or disclose a closed loop control system that activates the at least one flow effector by oscillation. In addition to the above comments on Claims 1 and 3, with respect to Claim 5 Stoy does not teach or disclose oscillation. In addition to the above comments on Claims 1, 2 and 4, with respect to Claim 6 Stoy does not teach or disclose a closed loop control system wherein the flow effector is only activated at angles of attach of the missile or aircraft forebody of between 20 to about 60 degrees. The above comments apply to Claim 7, which claims a slightly different configuration.

With respect to Claim 8, Stoy does not teach or disclose a closed loop control system, which is used to activate and deactivate at least one flow effector. The "control fins or canards" in Stoy are always activated – they can not be deactivated, which causes increased drag on the air vehicle. Furthermore, Stoy does not teach the use of a sensor having a signal and being positioned to detect flow separation or side forces, or an inertial measurement unit having an output wherein the signal of the sensor and output of the inertial measurement unit are used in part to activate or deactivate the at least one flow effector. In addition to the comments about Claim 8, with respect to Claims 11 and 12

Stoy further does not teach or disclose a flow effector capable of being activated and deactivated at frequencies of at least 1 or 20 Hz. In addition to the comments about Claim 8, with respect to Claim 13 Stoy further does not teach or disclose closed loop control system which activates and deactivates the at least one flow effector to create commanded side forces on the missile or aircraft forebody. In addition to the comments about Claims 8 and 12, with respect to Claim 14 Stoy further does not teach or disclose a closed loop control system which activates and deactivates the at least one flow effector to create additional side forces on the missile or aircraft forebody.

With respect to Claim 15, Stoy does not teach or disclose any of the steps including 1) using a sensor being positioned to estimate or determine side forces on the missile or aircraft forebody, 2) activating at least one flow effector to change the side forces based in part on the signal from the at least one sensor, 3) re-estimating or determining the side forces, or 4) deactivating the flow effector in response to the changed side forces. In addition to the comments about Claim 15, with respect to Claim 16 Stoy does not teach or disclose oscillation of at least one flow effector. In addition to the comments about Claim 15, with respect to Claim 18 Stoy does not teach or disclose a missile or aircraft forebody with asymmetries in the forebody. In addition to the comments about Claim 15, with respect to Claim 19 Stoy does not teach or disclose a closed loop control system wherein the flow effector is only activated at angles of attach of the missile or aircraft forebody of between 20 to about 60 degrees. In addition to the comments about Claim 15, with respect to Claim 20 Stoy does not teach or disclose a method wherein the at least one flow effector is a deployable flow effector. Given the reasons set forth in this response, the Applicants respectfully request withdrawal of this rejection.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

Claims 1-20 stand rejected under 35 USC §103 as being unpatentable over Rao et al. ('009) in view of Stoy ('243). The Applicants respectfully submit that the Examiner has not made a prima facie case of anticipation with respect to Claim 1-20. With respect to Claim 1, Rao et al. or Stoy do not teach or disclose a closed loop control system, which is used to activate and deactivate at least one flow effector. The "control fins or canards"

in Stoy are always activated – they can not be deactivated, which causes increased drag on the air vehicle. The strakes in Rao et al. are always to some degree activated causing increased drag on the air vehicle. Furthermore, Rao et al. or Stoy do not teach the use of a sensor having a signal and being positioned to detect flow separation or side forces, wherein the signal of the sensor is used in part to activate or deactivate the at least one flow effector. In addition to the above comments on Claim 1, with respect to Claim 2 Rao et al. or Stoy do not teach or disclose activating or deactivating at least one flow effector to minimize flow separation or change side forces on a missile or aircraft forebody. In addition to the above comments on Claim 1, with respect to Claim 3 Rao et al. or Stoy do not teach or disclose a closed loop control system that activates and deactivates the at least one flow effector to create commanded side forces on a missile or aircraft forebody. In addition to the above comments on Claims 1 and 2, with respect to Claim 4 Rao et al. or Stoy do not teach or disclose a closed loop control system that activates the at least one flow effector by oscillation. In addition to the above comments on Claims 1 and 3, with respect to Claim 5 Rao et al. or Stoy do not teach or disclose oscillation. In addition to the above comments on Claims 1, 2 and 4, with respect to Claim 6 Rao et al. or Stoy do not teach or disclose a closed loop control system wherein the flow effector is only activated at angles of attach of the missile or aircraft forebody of between 20 to about 60 degrees. The above comments apply to Claim 7, which claims a slightly different configuration.

With respect to Claim 8, Rao et al. or Stoy do not teach or disclose a closed loop control system, which is used to activate and deactivate at least one flow effector. The "control fins or canards" in Stoy are always activated – they can not be deactivated, which causes increased drag on the air vehicle. The strakes in Rao et al. are always to some degree activated causing increased drag on the air vehicle. Furthermore, Rao et al. or Stoy do not teach the use of a sensor having a signal and being positioned to detect flow separation or side forces, or an inertial measurement unit having an output wherein the signal of the sensor and output of the inertial measurement unit are used in part to activate or deactivate the at least one flow effector. In addition to the comments about Claim 8, with respect to Claims 11 and 12 Rao et al. or Stoy further do not teach or disclose a flow effector capable of being activated and deactivated at frequencies of at

least 1 or 20 Hz. In addition to the comments about Claim 8, with respect to Claim 13 Rao et al. or Stoy further do not teach or disclose closed loop control system which activates and deactivates the at least one flow effector to create commanded side forces on the missile or aircraft forebody. In addition to the comments about Claims 8 and 12, with respect to Claim 14 Rao et al. or Stoy further do not teach or disclose a closed loop control system which activates and deactivates the at least one flow effector to create additional side forces on the missile or aircraft forebody.

With respect to Claim 15, Rao et al. or Stoy do not teach or disclose any of the steps including 1) using a sensor being positioned to estimate or determine side forces on the missile or aircraft forebody, 2) activating at least one flow effector to change the side forces based in part on the signal from the at least one sensor, 3) re-estimating or determining the side forces, or 4) deactivating the flow effector in response to the changed side forces. In addition to the comments about Claim 15, with respect to Claim 16 Rao et al. or Stoy do not teach or disclose oscillation of at least one flow effector. In addition to the comments about Claim 15, with respect to Claim 17 Rao et al. or Stoy do not teach or disclose a missile or aircraft forebody comprising at least six flow effectors which are positioned and separated substantially equi-distantly about the center of the forebody. In addition to the comments about Claim 15, with respect to Claim 18 Rao et al. or Stoy do not teach or disclose a missile or aircraft forebody with asymmetries in the forebody. In addition to the comments about Claim 15, with respect to Claim 19 Rao et al. or Stoy do not teach or disclose a closed loop control system wherein the flow effector is only activated at angles of attach of the missile or aircraft forebody of between 20 to about 60 degrees. In addition to the comments about Claim 15, with respect to Claim 20 Rao et al. or Stoy do not teach or disclose a method wherein the at least one flow effector is a deployable flow effector.

The Applicants further submit that the Examiner has not given any reason, suggestion, or motivation in the references, or from the references cited as a whole for the person of ordinary skill to have combined or modified the references. The Applicants submit that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching suggestion or incentive supporting such combination. If such suggestion or incentive is in the references, the

Applicants respectfully request that the Examiner particularly point out the relevant sections of those references cited which suggest or motivate the combination of those references, particularly given the large differences in the types of devices described by these two references and their applications (i.e., one being applied on the skin and the other being implanted within the subject's body). If the Examiner is alleging that a person of ordinary skill would have be motivated to combine such references, the Applicant respectfully submits that how a person of ordinary skill in the art would have been motivated must be in the personal knowledge of the Examiner, and therefore respectfully requests that the Examiner in the next Official Action submit an affidavit detailing as specifically as possible such motivation (see 37 CFR §1.104 (d) (2)). Given the reasons in this response, the Applicants respectfully request withdrawal of this rejection..

CONCLUSION

For all the above reasons the Applicants respectfully submit that the application is in condition for allowance and that action is earnestly solicited.

Respectfully submitted,

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Dated

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